WHAT IS CLAIMED IS:

1. A centrifugal separation rotor for a centrifugal separator for separating solid contaminants from a liquid, said separator comprising a housing for mounting the rotor for rotation about a rotation axis by a drive, said rotor comprising:

a walled separation and containment vessel having an impervious radially outer side wall extending about and along the rotation axis to form radially inwardly from the side wall an annular contaminant separation and containment zone,

an outlet passage, disposed radially inwardly with respect to the radially outer side wall and leading externally of the vessel to define, during rotation, the radial boundary of the annular contaminant separation and containment zone, and, associated with the vessel,

an inlet for conveying liquid to be cleaned to the contaminant separation and containment zone at a rate less than the liquid can be discharged by the outlet passage, said inlet comprising

a liquid collector, defining an inlet region about the rotation axis radially inwardly of the outlet passage, and

a transfer passage communicating between the inlet region and the contaminant separation and containment zone of the vessel spaced axially from the outlet passage,

wherein the liquid collector comprises a divider wall, extending about and along the rotation axis and defining at least in part at one end thereof the transfer passage, having a liquid collection face, facing towards the rotation axis, arranged to receive liquid introduced into the inlet at a part spaced axially from the transfer passage and operable to support the liquid radially in response to centrifugal force exerted by rotation, permitting it to flow along the wall to the transfer passage, and

wherein the divider wall collection face increases in radial distance from the rotation axis along its length from the liquid introduction part to the transfer passage, the increase being arranged to cause, in operation, a component of the centrifugal force to confine axial flow of the contaminated liquid over the collection face in a direction towards the transfer passage.

2. A centrifugal separation rotor according to claim 1, wherein said rotor comprises a drive formed by a fluid motor arranged to be driven by liquid at elevated pressure, and the liquid collector is arranged to receive spent liquid from the fluid motor.

3. A centrifugal separation rotor according to claim 1, wherein said rotor comprises a drive comprising an impulse turbine having blades fixed to the rotor surrounding the rotation axis, said blades being arranged to be struck by at least one stream of liquid from the source of contaminated liquid to be cleaned directed from at least one stationary feed nozzle and to direct spent liquid onto the collection face.

4. A centrifugal separation rotor according to claim 1, wherein the rotor comprises a drive formed by a fluid motor comprising a reaction turbine having a plurality of jet reaction nozzles carried by the rotor.

5. A centrifugal separation rotor according to claim 1, wherein the rotor includes bearing means for mounting the rotor with respect to the separator housing for rotation, and at least the radially outer wall of the separation and containment vessel, and the contaminant separation and containment zone defined by the vessel, comprises a separation and containment module releasably attached to the inlet.

6. A centrifugal separation rotor according to claim 5, wherein the separation and containment module is attached to, and supported by, an end of the divider wall.

7. A centrifugal separation rotor according to claim 5, wherein the separation and containment module is made of a molded synthetic resin material.

8. A centrifugal separation rotor according to claim 1, wherein the rotation axis of the rotor is substantially vertical, and the transfer passage is arranged above the liquid introduction part of the inlet such that rotation of the collection face causes contaminated liquid introduced to the collection face to climb the face towards the transfer passage.

9. A centrifugal separation rotor according to claim 1, wherein the collection face of the divider wall diverges smoothly from the rotation axis as a function of distance along the rotation axis.

10. A centrifugal separation rotor according to claim 9, wherein the divergence is substantially linear as a function of axial distance.

11. A centrifugal separation rotor according to claim 1, further comprising at least one further separation and containment vessel associated with said separation and containment vessel and nested radially inwardly of the contaminant separation and containment zone, said further separation and containment vessel having an impervious radially outer side wall, an annular contaminant separation and containment zone bounded radially inwardly of said side wall by an outlet passage, and an associated inlet arranged to convey liquid to the annular zone at a rate less than the liquid can be discharged the annular zone through the outlet passage, said further separation and containment vessel being disposed such that the outlet passage of each surrounded vessel permits liquid to be conveyed radially by centrifugal forces to the next surrounding vessel.

12. A centrifugal separation rotor for a centrifugal separator for separating solid contaminants from a liquid, said separator comprising a housing for mounting the rotor for rotation about a rotation axis by drive, said rotor comprising:

a walled separation and containment vessel having an impervious radially outer side wall extending about and along the rotation axis to form radially inwardly from the side wall an annular contaminant separation and containment zone,

an outlet passage disposed radially inwardly with respect to the radially outer side wall and leading externally of the vessel to define, during rotation, a radial boundary of the annular contaminant separation and containment zone,

an inlet for conveying a liquid to be cleaned to the contaminant separation and containment zone at a rate less than the liquid can be passed through the outlet passage, said inlet comprising

a liquid collector defining an inlet region about the rotation axis radially inwardly of the outlet passage, and

a transfer passage communicating between the inlet region and the contaminant separation and containment zone of the vessel spaced axially from the outlet passage;

and

at least one further separation and containment vessel associated with said separation and containment vessel and nested radially inwardly of the contaminant separation and containment zone, said further separation and containment vessel having an impervious radially outer side wall, an annular contaminant separation and containment zone bounded radially inwardly of said side wall by an outlet passage, and an inlet arranged to convey liquid to the annular zone at a rate less than the liquid can be discharged from the annular zone through the outlet passage, each further separation and

containment vessel being disposed such that the outlet passage of each surrounded vessel permits liquid to be conveyed radially by centrifugal forces to the next surrounding vessel.

13. A centrifugal separation rotor for a centrifugal separator for separating solid contaminants from a liquid, said separator comprising a housing for mounting the rotor for rotation about a rotation axis by drive, said rotor comprising:

a walled separation and containment vessel having an impervious radially outer side wall extending about and along the rotation axis to form radially inwardly from the side wall an annular contaminant separation and containment zone,

an outlet passage disposed radially inwardly with respect to the radially outer side wall and leading externally of the vessel to define, during rotation, a radial boundary of the annular contaminant separation and containment zone,

an inlet associated with the vessel for conveying a liquid to be cleaned to the contaminant separation and containment zone at a rate less than the liquid can be discharged through the outlet passage, said inlet comprising

a liquid collector defining an inlet region about the rotation axis radially inwardly of the outlet passage, and

a transfer passage communicating between the inlet region and the contaminant separation and containment zone of the vessel spaced axially from the outlet passage;

and

a further walled separation and containment vessel coupled to said walled containment and separation vessel for rotation therewith, said further walled separation and containment vessel defining a canister having an outlet passage and an inlet passage having a greater flow capacity than the outlet passage and capable of admitting liquid to the vessel at a rate greater than it can pass through the outlet passage so that the vessel is maintained filled in operation, and having an impervious radially outer side wall extending around and along the rotation axis and forming an annular contaminant separation and containment zone extending radially inwardly from the side wall.

14. A centrifugal separation rotor according to claim 13, wherein the fluid motor is a reaction turbine, and the outlet passage of the canister comprises jet reaction nozzles of the reaction turbine.

15. A centrifugal separation rotor according to claim 13, wherein the canister comprises bearing means for mounting the rotor with respect to the separator housing for rotation, and the walled separation and containment vessel is mounted to the canister.

16. A centrifugal separation rotor according to claim 13, wherein at least the radially outer wall of the separation and containment vessel, and the contaminant separation and containment zone defined thereby, comprise a separation and containment module releasably attached to the canister.

17. A centrifugal separation rotor according to claim 13, wherein the separation and containment module is made of a molded synthetic resin material.

18. A centrifugal separation rotor according to claim 13, wherein the separation and containment vessel and canister are formed as an integral unit from a synthetic resin material.

19. A centrifugal separation rotor according to claim 13, wherein the canister is mounted for rotation by an interfacing bushing and spindle lubricated at the interface with liquid at elevated pressure conveyed to the canister, and said interfacing bushing and spindle comprise the inlet for the separation and containment vessel such that liquid forced from the interface is conveyed to the contaminant separation and containment zone of the vessel.

20. A centrifugal separation rotor according to claim 1, further comprising a further walled separation and containment vessel coupled to said walled containment and separation vessel for rotation therewith, said further walled separation and containment vessel defining a canister having an outlet passage and an inlet passage having greater flow capacity than the outlet passage and capable of admitting liquid to the vessel at a rate greater than it can pass through the outlet passage so that the vessel is maintained filled in operation, and having an impervious radially outer side wall extending around and along the rotation axis and forming an annular contaminant separation and containment zone extending radially inwardly from the side wall.

21. A centrifugal separator for separating solid contaminants from a liquid, said separator comprising a housing, an inlet opening into said housing for supplying contaminated liquid to said housing at elevated pressure, an outlet for discharging cleaned

liquid from said housing, a rotor mounted within the housing for rotation about a rotation axis extending through the housing, and a drive for rotating said rotor about the rotation axis, wherein the rotor comprises a centrifugal separation rotor according to claim 1.

22. A centrifugal separator for separating solid contaminants from a liquid, said separator comprising a housing, an inlet opening into said housing for supplying contaminated liquid to said housing at elevated pressure, an outlet for discharging cleaned liquid from said housing, a rotor mounted within the housing for rotation about a rotation axis extending through the housing, and a drive for rotating the rotor about the rotation axis, wherein the rotor comprises centrifugal separation rotor according to claim 12.

23. A centrifugal separator for separating solid contaminants from a liquid, said separator comprising a housing, an inlet opening into said housing for supplying contaminated liquid to said housing at elevated pressure, an outlet for discharging cleaned liquid from said housing, a rotor mounted within the housing for rotation about a rotation axis extending through the housing, and a drive for rotating the rotor about the rotation axis, wherein the rotor comprises centrifugal separation rotor according to claim 13.

24. A separation and containment module for a centrifugal separation rotor for separating solid contaminants from a liquid passed therethrough when driven about a rotation axis, wherein the rotor comprises a walled separation and containment vessel with an impervious radially outer side wall extending about and along the rotation axis and forming radially inwardly of the side wall an annular contaminant separation and containment zone, an inlet associated with said vessel for supplying contaminated liquid to said vessel, and an outlet passage communicating with the vessel radially inwardly of the outer side wall;

said module comprising the impervious radially outer vessel side wall defined about, and spaced radially from, a longitudinal axis; the outlet passage; means for releasably attaching the module to the rotor coaxially with respect to the rotation axis and for defining thereabout the outlet passage, and adjacent the outer side wall the annular separation and containment zone occupied by the liquid in the vessel during rotation; wherein the outlet passage is capable of discharging liquid at a rate greater than the liquid can be conveyed to the vessel.

25. A separation and containment module for a centrifugal separation rotor which comprises a canister for separating solid contaminants from a liquid passed therethrough

when driven about a rotation axis, said canister having a substantially impervious radially outer side wall extending around and along the rotation axis and an outlet passage communicating with the canister and arranged not to pass liquid from the canister at a greater rate than the liquid is conveyed to the canister so that the canister will be filled in operation, whereby said canister and outlet passage form an annular contaminant separation and containment zone radially inwardly of the outer side wall;

said module comprising a walled separation and containment vessel having a longitudinal axis, an impervious radially outer side wall extending about and along the longitudinal axis to receive liquid conveyed thereto, an outlet passage communicating with the vessel radially inwardly of the outer side wall, wherein said outlet passage is able to pass liquid at a rate greater than it can be conveyed to the vessel, and means for releasably attaching the module co-axially with respect to the canister to define thereabout the outlet passage and adjacent the outer side wall an annular separation and containment zone occupied by the liquid in the vessel during rotation.

26. A method of separating solid contaminants from a liquid using centrifugal forces, comprising:

rotating about an axis a vessel having an impervious radially outer side wall displaced from the axis and an outlet passage communicating with the vessel radially inwardly of the outer side wall;

introducing liquid to be cleaned to the rotating vessel at a rate not greater than the outlet passage is capable of discharging liquid from the vessel such that the liquid occupies a separation and containment zone bounded by said radially outer side wall and the outlet passage, wherein the liquid is conveyed to a collector face which faces the rotation axis, said collector face being disposed radially inwardly of the separation and containment zone and communicating with the zone via at least one transfer passage, and

rotating the collector face about the axis to generate sufficient centrifugal force to maintain the introduced liquid bearing against the collector face and cause liquid flow along the collector face to the at least one transfer passage,

wherein the liquid at the collector face is subjected to a component of the centrifugal force in a direction along the collector face towards the at least one transfer passage by increasing the distance of the collector face from the rotation axis in a direction along the axis towards the transfer passage, thereby causing the liquid to flow along the collector face only towards the transfer passage.

27. A method according to claim 26, further comprising forming the collection face on a divider wall substantially surrounded by the vessel separation and containment zone.

28. A method according to claim 26, further comprising disposing the vessel with the rotation axis extending substantially vertical and introducing liquid to the collection face below the transfer passage such that the component of centrifugal force causes the liquid to flow against gravity before transfer to the separation and containment zone.

29. A method according to claim 26, further comprising releasably mounting the separation and containment vessel to the collection face and, when the separation and containment zone is filled with separated contaminants, removing the vessel from the collection face, cleaning the zone or substituting the vessel with a new one and attaching the cleaned or substitute vessel to the collection face.

30. A method of improving the separation performance of a centrifugal separator having centrifugal separation rotor mounted for rotation and supplied with liquid at elevated pressure, wherein the liquid is passed through a canister in the rotor at such a rate as to keep the canister filled, said method comprising

disposing a separation and containment vessel coaxially with respect to the canister and coupled for rotation therewith, said separation and containment vessel having an impervious radially outer side wall displaced from the axis and an outlet passage communicating with the vessel radially inwardly of the outer side wall, said side wall and outlet passage defining an annular separation and containment zone in the vessel bounded radially by the side wall and outlet passage,

conveying liquid to be cleaned to the separation and containment zone at a rate not greater than the outlet passage is capable of discharging liquid from the vessel; and

rotating the canister and vessel about the axis at such a rate that liquid within the vessel occupies substantially all of, and is confined to, the annular separation and containment zone displaced radially outwardly of the canister.

31. A method according to claim 30, further comprising releasably mounting the separation and containment vessel to the canister and, when the separation and containment zone is filled with separated contaminants, removing the vessel from the canister, cleaning the zone or substituting the vessel with a new one and attaching the cleaned or substitute vessel to the canister.